

Yersiniosis (*Yersinia* spp.)

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Note: This chapter focuses on yersiniosis caused by *Yersinia* **other than** *Yersinia pestis*. For information about plague caused by *Yersinia pestis* refer to the chapter entitled “Plague.”

1) THE DISEASE AND ITS EPIDEMIOLOGY

A. Etiologic Agent

Yersiniosis is caused by the gram-negative bacteria *Yersinia enterocolitica* or *Yersinia pseudotuberculosis*.

Y. pseudotuberculosis has 6 serotypes with 4 subtypes; *Y. enterocolitica* has over 50 serotypes and 5 biotypes (strains). Many of these are considered non-pathogenic.

B. Clinical Description and Laboratory Diagnosis

The most common symptoms of yersiniosis are fever and diarrhea, sometimes bloody. The disease may also be manifested by enterocolitis and acute mesenteric lymphadenitis mimicking appendicitis. Complications can include post-infectious arthritis, systemic infections and erythema nodosum. Abdominal pain is usually seen with yersiniosis caused by *Y. pseudotuberculosis*, while enterocolitis is more commonly seen with *Y. enterocolitica*.

Laboratory diagnosis is based on isolating *Yersinia* from stool, vomitus or blood. Serological tests (agglutination and ELISA tests) are available in research and reference laboratories.

C. Reservoirs

The reservoirs for *Yersinia* species are primarily animals, notably pigs for *Y. enterocolitica*, and avian and mammalian hosts such as rodents and other small mammals for *Y. pseudotuberculosis*.

D. Modes of Transmission

Yersinia is transmitted via the fecal-oral route by ingestion of contaminated food or water or by contact with infected animals or people. Transmission can also occur person-to-person through certain types of sexual contact (e.g., oral-anal contact). Pathogenic strains of *Y. enterocolitica* have mostly been isolated from raw pork and pork products, including cold cuts. In contrast to many others foodborne pathogens, *Y. enterocolitica* is able to multiply under refrigeration and microaerophilic conditions. There have also been reports of nosocomial transmission and of transmission via transfusion of blood from donors with asymptomatic or mild infection.

E. Incubation Period

The incubation period is generally under 10 days, usually from 3 to 7 days.

F. Period of Communicability or Infectious Period

The disease is communicable for as long as the infected person is symptomatic and excretes *Yersinia* in stool (approximately 2–3 weeks), with untreated patients shedding for as long as 3 months. Children and adults have been reported with prolonged asymptomatic carriage.

G. Epidemiology

Yersiniosis occurs worldwide, with the highest isolation rates reported during the cold season in temperate climates (including North America). *Y. pseudotuberculosis* is primarily a zoonotic disease with humans as incidental hosts. The most important source of infection of *Y. enterocolitica* may be pork. Approximately two-thirds of the *Y. enterocolitica* cases occur in infants and children, while three-fourths of *Y. pseudotuberculosis*

cases are reported among 5–20 year olds. Cases of yersiniosis have been associated with disease in household pets. In New Jersey, approximately 40 cases of yersiniosis are reported to NJDHSS every year.

2) REPORTING CRITERIA AND LABORATORY TESTING SERVICES

A. New Jersey Department of Health and Senior Services (NJDHSS) Case Definition CASE CLASSIFICATION

A. CONFIRMED

A clinically compatible case, **AND**

- Isolation of *Yersinia sp.* from blood, stool or other clinical specimen, **OR**
- Significant rise of bacterial antibodies detected by agglutination test or ELISA.

PROBABLE

A clinically compatible case that is epidemiologically linked to a NJDHSS confirmed case.

POSSIBLE

Not used.

B. Laboratory Testing Services Available

The Public Health and Environmental Laboratories (PHEL) will test stool specimens for the presence of *Yersinia sp.* and confirm isolates from other laboratories. For more information, call the Enteric Laboratory at 609.292.7368.

After authorization from the Division of Epidemiology, Occupational and Environmental Services, PHEL will test implicated food items from a cluster or outbreak.

3) DISEASE REPORTING AND CASE INVESTIGATION

A. Purpose of Surveillance and Reporting

- To identify whether the case may be a source of infection for other persons (*e.g.*, a diapered child, daycare attendee or foodhandler) and, if so, to prevent further transmission.
- To identify transmission sources of public health concern (*e.g.*, a restaurant or a commercially distributed food product) and to stop transmission from such sources.

B. Laboratory and Healthcare Provider Reporting Requirements

The New Jersey Administrative Code (N.J.A.C. 8:57-1.8) stipulates that health care providers and laboratories report (by telephone, confidential fax, over the Internet using the Communicable Disease Reporting System [CDRS] or in writing) all cases of yersiniosis to the local health officer having jurisdiction over the locality in which the patient lives, or, if unknown, to the health officer in whose jurisdiction the health care provider requesting the laboratory examination is located.

C. Local Board of Health Reporting and Follow-Up Responsibilities

1. Reporting Requirements

The New Jersey Administrative Code (N.J.A.C. 8:57-1.8) stipulates that each local health officer must report the occurrence of any case of yersiniosis, as defined by the reporting criteria in Section 2 A above using the [CDS-1](#) form. A report can be filed electronically over the Internet using the confidential and secure CDRS.

2. Case Investigation

- a. It is the health officer's responsibility to investigate the case by interviewing the patient and others who may be able to provide pertinent information. Much of the information required on the form can be obtained from the patient's healthcare provider or the medical record.
- b. Use the following guidelines to complete the form:
 - 1) Accurately record the demographic information, date of symptom onset, symptoms, and medical information.
 - 2) When asking about exposure history (food, travel, activities, etc.), use the incubation period range for yersiniosis (3–7 days). Specifically, focus on the period beginning a minimum of 3 days prior to the disease onset date and back to no more than 7 days before onset. If possible, record any restaurants at which the case-patient ate, including food item(s) and date consumed.
 - 3) Ask questions about travel history and outdoor activities to help identify where the case-patient became infected.
 - 4) Ask questions about water supply (yersiniosis may be acquired through water consumption).
 - 5) Ask questions about household/close contact, pet or other animal contact.
 - 6) Determine whether the case-patient attends or works at a daycare facility and/or is a foodhandler.
 - 7) If there have been several attempts to obtain patient information (*e.g.*, the patient or healthcare provider does not return calls or does not respond to a letter, or the patient refuses to divulge information or is too ill to be interviewed), please fill out the form with as much information as possible. Please note on the form the reason why it could not be filled out completely.
 - 8) **If CDRS is used to report the case, the exposure, travel, employment and contact information can be recorded in the "Comments" section.**

After completing the form, it should be mailed (in an envelope marked "Confidential") to the NJDHSS Infectious and Zoonotic Diseases Program (IZDP), or the report can be filed electronically over the Internet using the confidential and secure CDRS. The mailing address is:

NJDHSS
Division of Epidemiology, Environmental and Occupational Health
Infectious and Zoonotic Diseases Program
P.O.Box 369
Trenton, NJ 08625-0369

- c. Institution of disease control measures is an integral part of the case investigation. It is the local health officer's responsibility to understand and, if necessary, to institute the control guidelines listed below in Section 4, "Controlling Further Spread."

4) CONTROLLING FURTHER SPREAD

A. Isolation and Quarantine Requirements (N.J.A.C. 8:57-1.12)

Foodhandlers with yersiniosis must be excluded from work.

Note: A case of yersiniosis is defined by the reporting criteria in Section 2 A of this chapter.

Minimum Period of Isolation of Patient

After their diarrhea has resolved, foodhandlers may only return to work after producing **one (1)** negative stool specimen. If a case-patient has been treated with an antimicrobial agent, the stool specimen shall not be submitted until at least 48 hours after cessation of therapy. **In outbreak circumstances, a second consecutive negative stool specimen is required prior to returning to work.**

Minimum Period of Quarantine of Contacts

Contacts with diarrhea who are foodhandlers shall be considered the same as case-patients and handled in the same fashion. No other restrictions need to be implemented otherwise.

Note: A foodhandler is any person directly preparing or handling food. This can include a patient care or child care provider.

B. Protection of Contacts of a Case

None.

C. Managing Special Situations

Daycare

Since yersiniosis may be transmitted person-to-person through fecal-oral transmission, it is important to carefully follow up on cases of yersiniosis in a daycare setting. General recommendations include:

- Children with *Yersinia* infection who have diarrhea should be excluded until their diarrhea has resolved.
- Children with *Yersinia* infection who have no diarrhea and are not otherwise ill may remain in the program if special precautions are taken (see below **Personal Preventive Measures/Education**).
- Since most staff in child care programs are considered foodhandlers, those with *Yersinia* in their stools (symptomatic or not) can remain on site, but must not prepare food or feed children until their diarrhea has resolved and they have **one (1)** negative stool test (taken at least 48 hours after completion of antibiotic therapy, if antibiotics are given).

School

Since yersiniosis may be transmitted person-to-person through fecal-oral transmission, it is important to carefully follow up on cases of yersiniosis in a school setting. General recommendations include:

- Students or staff with *Yersinia* infection who have diarrhea should be excluded until their diarrhea has resolved.
- Students or staff with *Yersinia* infection, who do not handle food, have no diarrhea or have mild diarrhea and are not otherwise sick, may remain in school if special precautions are taken (see below **Personal Preventive Measures/Education**).
- Students or staff who handle food and have *Yersinia* infection (symptomatic or not) must not prepare food until their diarrhea has resolved and they have **one (1)** negative stool test (taken at least 48 hours after completion of antibiotic therapy, if antibiotics are given).

Community Residential Programs

Actions taken in response to a case of yersiniosis in a community residential program will depend on the type of program and the level of functioning of the residents. In addition to reporting the outbreak to the Local Health Department, facility management should also report any such outbreak to the Division of Long-Term Care Compliance and Surveillance Program of the NJDHSS by phone 1.800.792.9770 or fax 609.633.9060. Written report should be mailed in 72 hours to NJDHSS, LTC Compliance and Surveillance Program, P.O. Box 367, Trenton, NJ 08625. The NJDHSS considers an event to be an “outbreak” if the infectious disease affects 10% of the population, either on one floor, a unit or total capacity of the facility, or three (3) cases of similar symptoms occur within a 48 – hour period.

In long-term care facilities, residents with yersiniosis should be placed on standard (including enteric) precautions until their symptoms subside *and* they have **one (1)** negative test for *Yersinia*. Staff members who give direct patient care (e.g., feed patients, give mouth or denture care, or give medications) are considered foodhandlers and are subject to foodhandler restrictions (see Section 4 A above). In addition, staff members with *Yersinia* infection who are not foodhandlers should not work until their diarrhea has resolved.

In residential facilities for the developmentally disabled, staff and clients with yersiniosis must refrain from handling or preparing food for other residents until their diarrhea has subsided and they have **one (1)** negative stool test for *Yersinia* (submitted at least 48 hours after completion of antibiotic therapy, if antibiotics are given). In addition, staff members with *Yersinia* infection who are not foodhandlers should not work until their diarrhea has resolved.

Reported Incidence Is Higher than Usual/Outbreak Suspected

If the number of reported cases of yersiniosis in city/town is higher than usual, or if an outbreak is suspected, investigate to determine the source of infection and mode of transmission. A common vehicle (such as water, food or association with a daycare center) should be sought and applicable preventive or control measures should be instituted. If food is the suspected source of infection, use the [Patient Food History Listing](#), [Patient Symptoms Line Listing](#) and [Food Specific Attack Rate Table Worksheet](#) forms to facilitate recording additional information. It is requested that the local health officer fax the completed forms to the NJDHSS IZDP. This information will help link other complaints from neighboring towns, thus helping to identify foodborne illness outbreaks. Control of person-to-person transmission requires special emphasis on personal cleanliness and sanitary disposal of feces. Consult with the NJDHSS IZDP at 609.588.7500. The Program staff can help determine a course of action to prevent further cases and can perform surveillance for cases that may cross several jurisdictions and therefore be difficult to identify at a local level.

D. Preventive Measures

Environmental Measures

Implicated food items must be removed from the environment. A decision about testing implicated food items can be made in consultation with the IZDP and the Food and Drug Safety Program (FDSP). The FDSP can help coordinate pickup and testing of food samples. If a commercial product is suspected, the FDSP will coordinate follow-up with relevant outside agencies (e.g. FDA, USDA). The FDSP may be reached at 609.588.3123.

Note: The role of the FDSP is to provide policy and technical assistance with the environmental investigation such as interpreting the New Jersey Food Code, conducting a HACCP risk assessment, initiating enforcement actions and collecting food samples.

The general policy of the PHEL is only to test food samples implicated in suspected outbreaks, not in single cases (except when botulism is suspected). The health officer may suggest that the holders of food implicated in single case incidents locate a private laboratory that will test food or store the food in their freezer for a period of time in the event additional reports are received. However, a single confirmed case from leftover food consumed within the incubation period may be considered for testing only under special circumstances.

Personal Preventive Measures/Education

To avoid exposure, recommend that individuals:

- Always wash their hands thoroughly with soap and water before eating or preparing food, after using the toilet, after changing diapers, and after touching their pets or other animals.
- In a daycare setting, dispose of feces in a sanitary manner.
- After changing diapers, wash the child's hands as well as their own.
- Keep food that will be eaten raw, such as vegetables, from becoming contaminated by animal-derived food products.

- Avoid letting infants or young children touch pets (especially puppies and kittens) that are sick with diarrhea.
- Make sure to thoroughly cook all food products from animals, especially pork products.
- Avoid sexual practices that may permit fecal-oral transmission. Latex barrier protection should be emphasized as a way to prevent the spread of yersiniosis to sexual partners as well as to prevent the exposure to and transmission of other pathogens.

ADDITIONAL INFORMATION

A [*Yersiniosis Fact Sheet*](#) can be obtained at the NJDHSS website at <<http://www.state.nj.us/health>>.

There is no formal CDC surveillance case definition for yersiniosis. CDC case definitions are used by state health departments and CDC to maintain uniform standards for national reporting. When reporting a case to the NJDHSS, always refer to the criteria in Section 2A.

REFERENCES

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